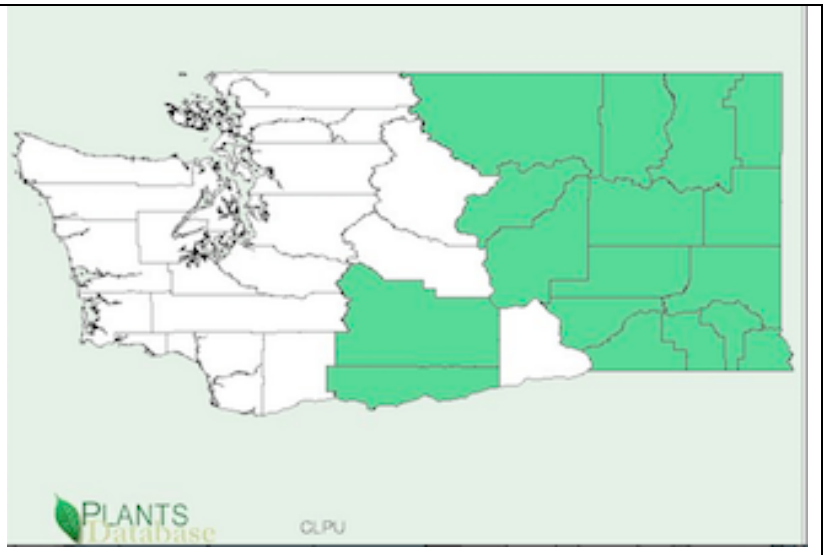
Plant Propagation Protocol for *Clarkia pulchella*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/CLPU.pdf

TAXONOMY	
Plant Family	
Scientific Name:	Onagraceae [10]
Common Name:	Evening Primrose
Species Scientific Name	
Scientific Name	*Clarkia pulchella* Pursh [10]
Varieties:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s)	
Common Name(s):	Elkhorn Clarkia, Ragged robin, pinkfairies, deerhorn [2,8,9,10]
Species Code	CLPU [10]
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	

	
Ecological distribution	Open ponderosa pine forest, shrub-steppe, foothills/intermontane prairie[4,8,9]
Climate and elevation range	1100-6000 ft.[2,3]
Local habitat and abundance;	Dry, thin soils, rocky screes, channeled scablands, grassy balds within forests Usually found on south slopes in dry, open grassland or open Ponderosa pine forest[7] Dry, sandy soils often in association with *Artemisia tridentata* [d], *Achillea millefolium, Pseudoroegneria spicata, Chrysothamnus nauseosus, Festuca idahoensis, Lupinus sericeus,* and *Purshia tridentata*[4] Festuca idahoensis/Koeleria cristata, Festuca idahoensis/Agropyron spicatum/ Lupinus spp., Festuca idahoensis/Agropyron spicatum/Balsamorhiza sagittata , Agropyron spicatum/Poa sandbergii/Lupinus spp., Agropyron/Poa sandbergii/Scutellaria angustifolia associations. Tends to increase % cover where heavy grazing by ungulates has reduced perennial bunchgrasses[2]
Plant strategy type / successional stage	Can be a colonizer, tends to increase with disturbance[2] and can be an effective competitor to invasive, non-native grasses[1]
Plant characteristics	Annual forb. Erect, as much as 5 dm tall. Four petals that are 3-lobed, the middle lobe prominent, larger than the lateral lobes, bright pink to lavender in color (occasionally white) with lighter veins. Base of petal long and narrow. [5,8] Four fertile outer stamens, with 4 greatly reduced, sterile inner stamens. Anthers white to lavender, reflexing after

	dehiscence; pollen white; filaments lavender to purple; stigma white, conspicuously 4-lobed. Leaves linear to lanceolate, entire, 2-8 cm long, 2-11 mm wide. [9]
PROPAGATION DETAILS	
Ecotype	Paradise Creek drainage, Pullman, WA[7]
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type:	
Time to Grow	3 months[7]
Target Specifications:	Tight root plug in container[7]
Propagule Collection:	Wild seeds are collected in August when the capsules begin to split open. Plants in seed increase beds are cut and dried in paper bags at room temperature, but the plant flowers and matures seed indeterminately and judgment must be made as to when to cut plants to maximize seed production. Seeds are small and dark brown and approximately 50 per capsule. [5,7]
Propagule Processing/Propagule Characteristics:	For small amounts, capsules are crushed and seed separated with a hand screen. Fine material is removed with an air column separator. Larger volumes are threshed with a hammermill and cleaned with air screen equipment. Seed is stored at 40˚ F at 40% relative humidity after cleaning. Seed density is 2,090,323 seeds/lb. for this ecotype.[7] Seeds remain viable up to 5 years under optimal storage conditions in the lab, though viability decreases each year[5]
Pre-Planting Propagule Treatments	None required. There may be an after ripening requirement. Seed lots have been observed to germinate at higher rates after storage in cold, dry conditions. 30 day cold/moist stratification did not enhance germination in trials[7]
Growing Area Preparation / Annual Practices for Perennial Crops:	In February, seeds are sown in 10 cu. In. Ray Leach Super Cell Conetainers filled with Sunshine #4. Seeds are covered lightly with media. A thin layer of pea gravel is applied to prevent seeds and media from floating. Conetainers are watered deeply. Using planting soils with slower drainage has been observed to increase diseases of this species in the Plant Materials Center greenhouse.[7]
Establishment Phase:	Medium is kept moist until germination occurs. Germination usually occurs in 5-7 days and is complete in 10-12 days.[7] Germination is inhibited by high temperatures[5]
Length of Establishment Phase:	2 weeks[7]
Active Growth Phase :	Plants are watered deeply every other day and fertilized once a week with a water-soluble, complete fertilizer containing micronutrients.[7]
Length of Active Growth Phase:	2 months[7]

Hardening Phase:	Plants are moved to a cold frame in late March or early April. Exposure to direct sunlight and cool temperatures is increased over a period of two weeks. Plants may begin flowering at that time.[7]
Length of Hardening Phase:	2-4 weeks[7]
Harvesting, Storage and Shipping (of seedlings):	
Length of Storage (of seedlings, between nursery and outplanting):	
Guidelines for Outplanting / Performance on Typical Sites:	In an experimental trial by Newman and Pilson, 40% of seedlings outplanted in November survived the winter.[6]
Other Comments:	Reseeds itself well where there are openings in vegetative cover to establish. Direct seeding trials conducted in the fall in the field showed high rates of germination, while seed sown in spring failed to germinate. [7] Seeds seem to lack a dispersal mechanism and are generally found clumped in the vicinity of the mother plant. The presence of numerous seeds but relatively few flowering plants suggests that many of the seeds do not survive to reproductive maturity.[6]
INFORMATION SOURCES	
References:	1. Bryant JAM, Reynecke BK and Brown RL. 2013. Geology and topography effects on exotic plant distribution in a semiarid mima mound prairie in eastern Washington. Northwest Science 87(1):12-23. 2. Johnson Jr CG and Swanson DK. 2005. Bunchgrass plant communities of the Blue and Ochoco Mountains: A guide for managers. USDA Forest Service, Pacific Northwest Research Station. General Technical Report PNW-GTR-641 Available at http://www.fs.fed.us/pnw/publications_gtr641/pnw-gtr641b.pdf 3. Klinkenberg, Brian. (Editor) 2013. *E-Flora BC: Electronic Atlas of the Plants of British Columbia* [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 4/14/2014 7:20:35 PM] 4. Küchler AW. 1964. Manual to accompany the map of potential natural vegetation of the conterminous U.S. American Geographic Society

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Date Protocol Created or Updated (MM/DD/YY):	04/18/14

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